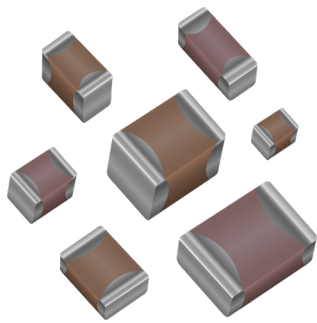


MLCC Tin/Lead Termination "B" (LD Series)

C0G (NP0) – General Specifications



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. AVX has provided in the following pages a full range of values that we are currently offering in this special "B" termination. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Not RoHS Compliant

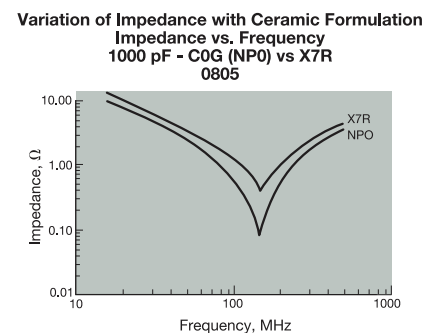
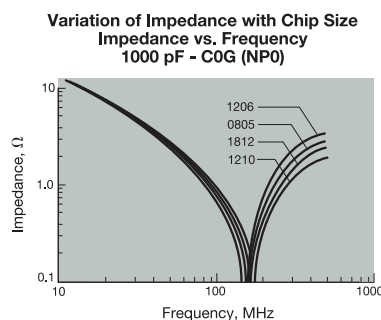
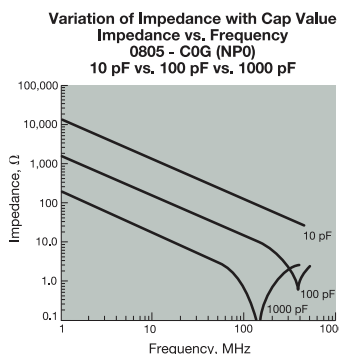
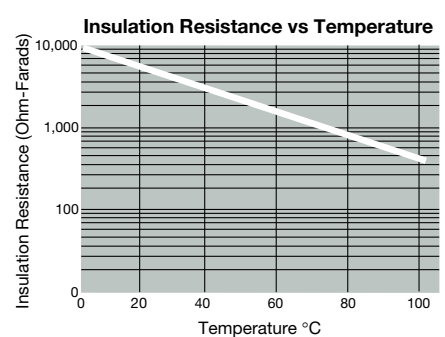
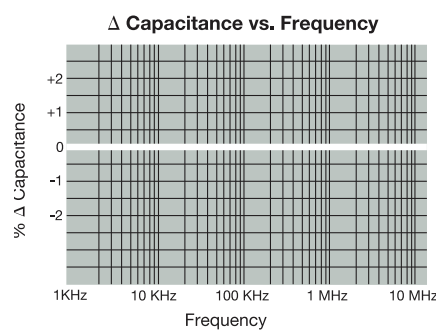
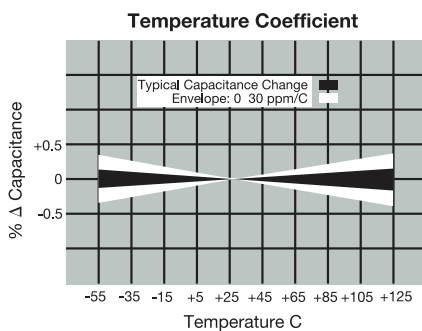
PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

LD05	5	A	101	J	A	B	2	A
Size	Voltage	Dielectric	Capacitance Code (In pF)	Capacitance Tolerance	Failure Rate	Terminations	Packaging	Special Code
LD02 - 0402 LD03 - 0603 LD04 - 0504* LD05 - 0805 LD06 - 1206 LD10 - 1210 LD12 - 1812 LD13 - 1825 LD14 - 2225 LD20 - 2220	6.3V = 6 10V = Z 16V = Y 25V = 3 35V = D 50V = 5 100V = 1 200V = 2 500V = 7	C0G (NP0) = A X7R = C X5R = D X8R = F	2 Sig. Digits + Number of Zeros	B = ± 10 pF (<10pF) C = ± 25 pF (<10pF) D = ± 50 pF (<10pF) F = $\pm 1\%$ (≥ 10 pF) G = $\pm 2\%$ (≥ 10 pF) J = $\pm 5\%$ K = $\pm 10\%$ M = $\pm 20\%$	A = Not Applicable	B = 5% min lead X = FLEXITERM® with 5% min lead** **X7R only	2 = 7" Reel 4 = 13" Reel Contact Factory For Multiples*	A = Std. Product

*LD04 has the same CV ranges as LD03.

See FLEXITERM® section for CV options

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

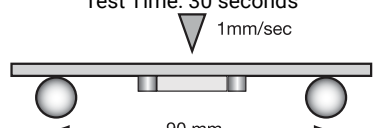


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MLCC Tin/Lead Termination “B”

C0G (NP0) – Specifications and Test Methods



Parameter/Test		NP0 Specification Limits	Measuring Conditions	
Operating Temperature Range		-55°C to +125°C	Temperature Cycle Chamber	
Capacitance		Within specified tolerance	Freq.: 1.0 MHz $\pm$ 10% for cap $\leq$ 1000 pF 1.0 kHz $\pm$ 10% for cap $>$ 1000 pF Voltage: 1.0Vrms $\pm$.2V	
Q		<30 pF: $Q \geq 400+20 \times \text{Cap Value}$ ≥ 30 pF: $Q \geq 1000$		
Insulation Resistance		100,000M Ω or 1000M Ω - μ F, whichever is less	Charge device with rated voltage for 60 $\pm$ 5 secs @ room temp/humidity	
Dielectric Strength		No breakdown or visual defects	Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) Note: Charge device with 150% of rated voltage for 500V devices.	
Resistance to Flexure Stresses	Appearance	No defects	Deflection: 2mm Test Time: 30 seconds 	
	Capacitance Variation	$\pm 5\%$ or ± 5 pF, whichever is greater		
	Q	Meets Initial Values (As Above)		
	Insulation Resistance	$\geq$ Initial Value $\times$ 0.3		
Solderability		$\geq 95\%$ of each terminal should be covered with fresh solder	Dip device in eutectic solder at $230 \pm 5^\circ\text{C}$ for 5.0 ± 0.5 seconds	
Resistance to Solder Heat	Appearance	No defects, $<25\%$ leaching of either end terminal	Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 ± 2 hours before measuring electrical properties.	
	Capacitance Variation	$\leq \pm 2.5\%$ or ± 25 pF, whichever is greater		
	Q	Meets Initial Values (As Above)		
	Insulation Resistance	Meets Initial Values (As Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
Thermal Shock	Appearance	No visual defects	Step 1: $-55^\circ\text{C} \pm 2^\circ$	30 ± 3 minutes
	Capacitance Variation	$\leq \pm 2.5\%$ or ± 25 pF, whichever is greater	Step 2: Room Temp	≤ 3 minutes
	Q	Meets Initial Values (As Above)	Step 3: $+125^\circ\text{C} \pm 2^\circ$	30 ± 3 minutes
	Insulation Resistance	Meets Initial Values (As Above)	Step 4: Room Temp	≤ 3 minutes
	Dielectric Strength	Meets Initial Values (As Above)	Repeat for 5 cycles and measure after 24 hours at room temperature	
Load Life	Appearance	No visual defects	Charge device with twice rated voltage in test chamber set at $125^\circ\text{C} \pm 2^\circ\text{C}$ for 1000 hours (+48, -0). Remove from test chamber and stabilize at room temperature for 24 hours before measuring.	
	Capacitance Variation	$\leq \pm 3.0\%$ or $\pm .3$ pF, whichever is greater		
	Q	≥ 30 pF: $Q \geq 350$ ≥ 10 pF, <30 pF: $Q \geq 275 + 5C/2$ <10 pF: $Q \geq 200 + 10C$		
	Insulation Resistance	$\geq$ Initial Value $\times$ 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
Load Humidity	Appearance	No visual defects	Store in a test chamber set at $85^\circ\text{C} \pm 2^\circ\text{C}$ / $85\% \pm 5\%$ relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature for 24 ± 2 hours before measuring.	
	Capacitance Variation	$\leq \pm 5.0\%$ or $\pm .5$ pF, whichever is greater		
	Q	≥ 30 pF: $Q \geq 350$ ≥ 10 pF, <30 pF: $Q \geq 275 + 5C/2$ <10 pF: $Q \geq 200 + 10C$		
	Insulation Resistance	$\geq$ Initial Value $\times$ 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		

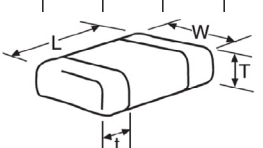
MLCC Tin/Lead Termination “B”



C0G (NP0) – Capacitance Range

PREFERRED SIZES ARE SHADED

SIZE		LD02			LD03				LD05					LD06						
Soldering		Reflow/Wave			Reflow/Wave				Reflow/Wave					Reflow/Wave						
Packaging		All Paper			All Paper				Paper/Embossed					Paper/Embossed						
(L) Length	mm (in.)	1.00 ± 0.10 (0.040 ± 0.004)			1.60 ± 0.15 (0.063 ± 0.006)				2.01 ± 0.20 (0.079 ± 0.008)					3.20 ± 0.20 (0.126 ± 0.008)						
(W) Width	mm (in.)	0.50 ± 0.10 (0.020 ± 0.004)			0.81 ± 0.15 (0.032 ± 0.006)				1.25 ± 0.20 (0.049 ± 0.008)					1.60 ± 0.20 (0.063 ± 0.008)						
(t) Terminal	mm (in.)	0.25 ± 0.15 (0.010 ± 0.006)			0.35 ± 0.15 (0.014 ± 0.006)				0.50 ± 0.25 (0.020 ± 0.010)					0.50 ± 0.25 (0.020 ± 0.010)						
WVDC		16	25	50	16	25	50	100	16	25	50	100	200	16	25	50	100	200	500	
Cap (pF)	0.5	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	1.0	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	1.2	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	1.5	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	1.8	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	2.2	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	2.7	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	3.3	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	3.9	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	4.7	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	5.6	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	6.8	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	8.2	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	10	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	12	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	15	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	18	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	22	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	27	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	33	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	39	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	47	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	56	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	68	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	82	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	100	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	120	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	150	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	180	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	J	
	220	C	C	C	G	G	G	G	J	J	J	J	J	J	J	J	J	J	M	
	270	C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	
	330	C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	
	390	C	C	C	G	G	G	G	J	J	J	J	M	J	J	J	J	J	M	
	470	C	C	C	G	G	G		J	J	J	J	M	J	J	J	J	J	M	
	560				G	G	G		J	J	J	J	M	J	J	J	J	J	M	
	680				G	G	G		J	J	J	J		J	J	J	J	J	P	
	820				G	G	G		J	J	J	J		J	J	J	J	M		
	1000				G	G	G		J	J	J	J		J	J	J	J	Q		
	1200					G			J	J	J			J	J	J	J	Q		
	1500								J	J	J			J	J	J	M	Q		
	1800								J	J	J			J	J	M	M			
	2200								J	J	N			J	J	M	P			
	2700								J	J	N			J	J	M	P			
	3300								J	J				J	J	M	P			
	3900								J	J				J	J	M	P			
	4700								J	J				J	J	M	P			
	5600													J	J	M				
	6800													M	M					
	8200													M	M					
Cap (pF)	0.010													M	M					
	0.012																			
	0.015																			
	0.018																			
	0.022																			
	0.027																			
	0.033																			
	0.039																			
0.047																				
0.068																				
0.082																				
0.1																				
WVDC		16	25	50	16	25	50	100	16	25	50	100	200	16	25	50	100	200	500	
SIZE		LD02			LD03				LD05					LD06						
Letter		A	C	E	G	J	K	M	N	P	Q	X	Y	Z						
Max. Thickness		0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)						
		PAPER						EMBOSSED												



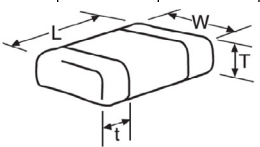
MLCC Tin/Lead Termination “B”

C0G (NP0) – Capacitance Range



PREFERRED SIZES ARE SHADED

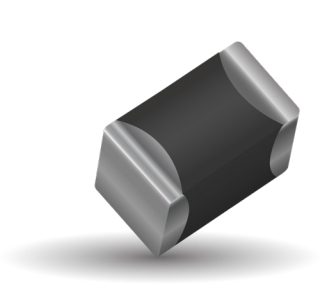
SIZE		LD10					LD12					LD13			LD14		
Soldering		Reflow Only					Reflow Only					Reflow Only			Reflow Only		
Packaging		Paper/Embossed					All Embossed					All Embossed			All Embossed		
(L) Length	mm (in.)	3.20 ± 0.20 (0.126 ± 0.008)					4.50 ± 0.30 (0.177 ± 0.012)					4.50 ± 0.30 (0.177 ± 0.012)			5.72 ± 0.25 (0.225 ± 0.010)		
(W) Width	mm (in.)	2.50 ± 0.20 (0.098 ± 0.008)					3.20 ± 0.20 (0.126 ± 0.008)					6.40 ± 0.40 (0.252 ± 0.016)			6.35 ± 0.25 (0.250 ± 0.010)		
(t) Terminal	mm (in.)	0.50 ± 0.25 (0.020 ± 0.010)					0.61 ± 0.36 (0.024 ± 0.014)					0.61 ± 0.36 (0.024 ± 0.014)			0.64 ± 0.39 (0.025 ± 0.015)		
	WVDC	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200
Cap (pF)	0.5																
	1.0																
	1.2																
	1.5																
	1.8																
	2.2																
	2.7																
	3.3																
	3.9																
	4.7																
	5.6																
	6.8																
	8.2																
	10					J											
	12					J											
	15					J											
	18					J											
	22					J											
	27					J											
	33					J											
	39					J											
	47					J											
	56					J											
	68					J											
	82					J											
	100					J											
	120					J											
	150					J											
	180					J											
	220					J											
	270					J											
	330					J											
	390					M											
	470					M											
	560	J	J	J	J	M											
	680	J	J	J	J	M											
	820	J	J	J	J	M											
	1000	J	J	J	J	M	K	K	K	K	M	M	M	M	M	M	P
	1200	J	J	J	J	M	M	K	K	K	M	M	M	M	M	M	P
	1500	J	J	J	M	M	K	K	K	K	M	M	M	M	M	M	P
	1800	J	J	J	M		K	K	K	K	M	M	M	M	M	M	P
	2200	J	J	J	Q		K	K	K	K	P	M	M	M	M	M	P
	2700	J	J	J	Q		K	K	K	P	Q	M	M	M	M	M	P
	3300	J	J	J			K	K	K	P	Q	M	M	M	M	M	P
	3900	J	J	M			K	K	K	P	Q	M	M	M	M	M	P
	4700	J	J	M			K	K	K	P	Q	M	M	M	M	M	P
	5600	J	J				K	K	M	P	X	M	M	M	M	M	P
	6800	J	J				K	K	M		X	M	M	M	M	M	P
	8200	J	J				K	M	M			M	M		M	M	P
	Cap (pF)	0.010	J	J				K	M	M			M	M		M	M
0.012		J	J				K	M				M	M		M	M	P
0.015							M	M				M	M		M	M	Y
0.018							M	M				P	M		M	M	Y
0.022							M	M				P			M	Y	Y
0.027							M	M				P			P	Y	Y
0.033							M	M				P			P		
0.039							M	M				P			P		
0.047							M	M				P			P		
		0.068						M	M							P	
	0.082						M	M							Q		
	0.1														Q		
	WVDC	25	50	100	200	500	25	50	100	200	500	50	100	200	50	100	200
SIZE		LD10					LD12					LD13			LD14		
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z				
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)				
	PAPER					EMBOSSED											



MLCC Tin/Lead Termination “B”



X8R – General Specifications



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a “B” in the 12th position of the AVX Catalog Part Number. This fulfills AVX’s commitment to providing a full range of products to our customers. AVX has provided in the following pages a full range of values that we are currently offering in this special “B” termination. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination “B” products.

Not RoHS Compliant

PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

LD05	5	F	101	J	A	B	2	A
Size	Voltage	Dielectric	Capacitance Code (In pF)	Capacitance Tolerance	Failure Rate	Terminations	Packaging	Special Code
LD02 - 0402	6.3V = 6	X8R = F	2 Sig. Digits + Number of Zeros	B = ± 10 pF (<10pF) C = ± 25 pF (<10pF) D = ± 50 pF (<10pF) F = $\pm 1\%$ (≥ 10 pF) G = $\pm 2\%$ (≥ 10 pF) J = $\pm 5\%$ K = $\pm 10\%$ M = $\pm 20\%$	A = Not Applicable	B = 5% min lead X = FLEXITERM® with 5% min lead**	2 = 7" Reel 4 = 13" Reel	A = Std. Product
LD03 - 0603	10V = Z							
LD04 - 0504*	16V = Y							
LD05 - 0805	25V = 3							
LD06 - 1206	35V = D							
LD10 - 1210	50V = 5							
LD12 - 1812	100V = 1							
LD13 - 1825	200V = 2							
LD14 - 2225	500V = 7							
LD20 - 2220								

LD04 has the same CV ranges as LD03.

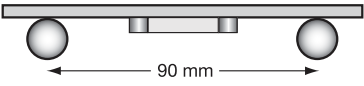
See FLEXITERM® section for CV options

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

MLCC Tin/Lead Termination “B”

X8R – Specifications and Test Methods



Parameter/Test		X8R Specification Limits	Measuring Conditions	
Operating Temperature Range		-55°C to +150°C	Temperature Cycle Chamber	
Capacitance		Within specified tolerance	Freq.: 1.0 kHz $\pm$ 10% Voltage: 1.0Vrms $\pm$.2V	
Dissipation Factor		$\leq$ 2.5% for $\geq$ 50V DC rating $\leq$ 3.5% for 25V DC and 16V DC rating		
Insulation Resistance		100,000M Ω or 1000M Ω - μ F, whichever is less	Charge device with rated voltage for 120 $\pm$ 5 secs @ room temp/humidity	
Dielectric Strength		No breakdown or visual defects	Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) Note: Charge device with 150% of rated voltage for 500V devices.	
Resistance to Flexure Stresses	Appearance	No defects	Deflection: 2mm Test Time: 30 seconds 	
	Capacitance Variation	$\leq \pm 12\%$		
	Dissipation Factor	Meets Initial Values (As Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3		
Solderability		$\geq$ 95% of each terminal should be covered with fresh solder	Dip device in eutectic solder at 230 $\pm$ 5°C for 5.0 $\pm$ 0.5 seconds	
Resistance to Solder Heat	Appearance	No defects, <25% leaching of either end terminal	Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 $\pm$ 2 hours before measuring electrical properties.	
	Capacitance Variation	$\leq \pm 7.5\%$		
	Dissipation Factor	Meets Initial Values (As Above)		
	Insulation Resistance	Meets Initial Values (As Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
Thermal Shock	Appearance	No visual defects	Step 1: -55°C $\pm$ 2°	30 $\pm$ 3 minutes
	Capacitance Variation	$\leq \pm 7.5\%$	Step 2: Room Temp	$\leq$ 3 minutes
	Dissipation Factor	Meets Initial Values (As Above)	Step 3: +125°C $\pm$ 2°	30 $\pm$ 3 minutes
	Insulation Resistance	Meets Initial Values (As Above)	Step 4: Room Temp	$\leq$ 3 minutes
	Dielectric Strength	Meets Initial Values (As Above)	Repeat for 5 cycles and measure after 24 $\pm$ 2 hours at room temperature	
Load Life	Appearance	No visual defects	Charge device with 1.5 rated voltage ($\leq$ 10V) in test chamber set at 150°C $\pm$ 2°C for 1000 hours (+48, -0) Remove from test chamber and stabilize at room temperature for 24 $\pm$ 2 hours before measuring.	
	Capacitance Variation	$\leq \pm 12.5\%$		
	Dissipation Factor	$\leq$ Initial Value x 2.0 (See Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
Load Humidity	Appearance	No visual defects	Store in a test chamber set at 85°C $\pm$ 2°C/ 85% $\pm$ 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature and humidity for 24 $\pm$ 2 hours before measuring.	
	Capacitance Variation	$\leq \pm 12.5\%$		
	Dissipation Factor	$\leq$ Initial Value x 2.0 (See Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		

MLCC Tin/Lead Termination “B”

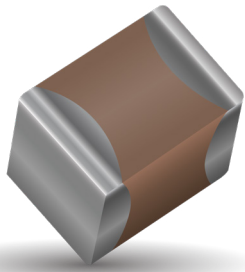
X8R – Capacitance Range



SIZE				LD03			LD05			LD06			
		WVDC		25V	50V		25V	50V		25V	50V		
271	Cap	270		G	G								
331	(pF)	330		G	G		J	J					
471		470		G	G		J	J					
681		680		G	G		J	J					
102		1000		G	G		J	J		J	J		
152		1500		G	G		J	J		J	J		
182		1800		G	G		J	J		J	J		
222		2200		G	G		J	J		J	J		
272		2700		G	G		J	J		J	J		
332		3300		G	G		J	J		J	J		
392		3900		G	G		J	J		J	J		
472		4700		G	G		J	J		J	J		
562		5600		G	G		J	J		J	J		
682		6800		G	G		J	J		J	J		
822	Cap	8200		G	G		J	J		J	J		
103	(µF)	0.01		G	G		J	J		J	J		
123		0.012		G	G		J	J		J	J		
153		0.015		G	G		J	J		J	J		
183		0.018		G	G		J	J		J	J		
223		0.022		G	G		J	J		J	J		
273		0.027		G	G		J	J		J	J		
333		0.033		G	G		J	J		J	J		
393		0.039		G	G		J	J		J	J		
473		0.047		G	G		J	J		J	J		
563		0.056		G			N	N		M	M		
683		0.068		G			N	N		M	M		
823		0.082					N	N		M	M		
104		0.1					N	N		M	M		
124		0.12					N	N		M	M		
154		0.15					N	N		M	M		
184		0.18					N			M	M		
224		0.22					N			M	M		
274		0.27								M	M		
334		0.33								M	M		
394		0.39								M			
474		0.47								M			
684		0.68											
824		0.82											
105		1											
		WVDC		25V	50V		25V	50V		25V	50V		
SIZE				LD03			LD05			LD06			
Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSSED							

MLCC Tin/Lead Termination "B"

X7R – General Specifications



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. AVX has provided in the following pages a full range of values that we are currently offering in this special "B" termination. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Not RoHS Compliant

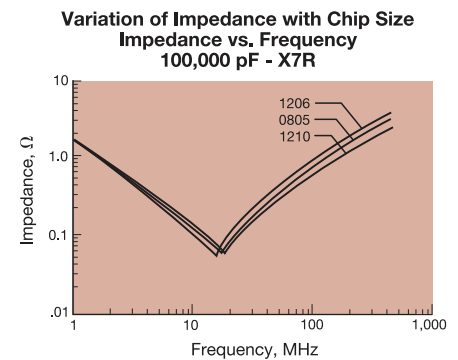
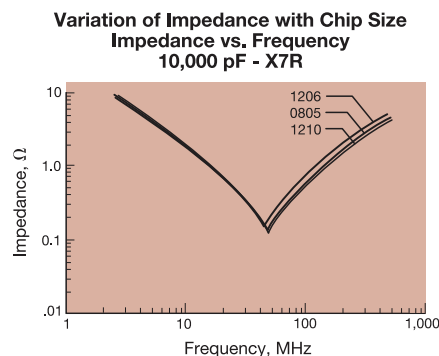
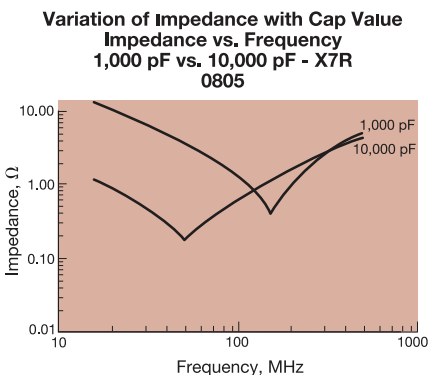
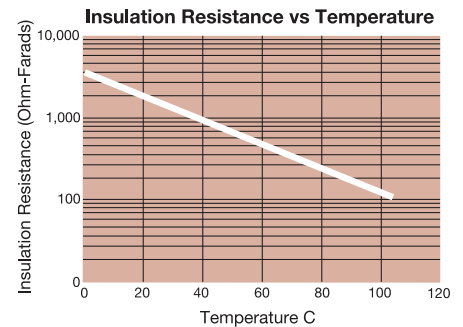
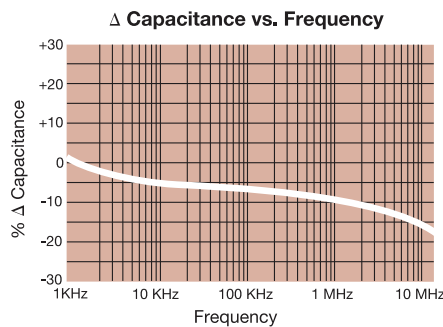
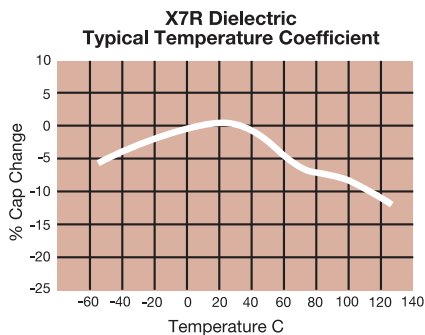
PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

LD05	5	C	101	J	A	B	2	A
Size	Voltage	Dielectric	Capacitance Code (In pF)	Capacitance Tolerance	Failure Rate	Terminations	Packaging	Special Code
LD03 - 0603 LD04 - 0504* LD05 - 0805 LD06 - 1206 LD10 - 1210 LD12 - 1812 LD13 - 1825 LD14 - 2225 LD20 - 2220	6.3V = 6 10V = Z 16V = Y 25V = 3 35V = D 50V = 5 100V = 1 200V = 2 500V = 7	X7R = C	2 Sig. Digits + Number of Zeros	B = ± 10 pF (<10pF) C = ± 25 pF (<10pF) D = ± 50 pF (<10pF) F = $\pm 1\%$ (≥ 10 pF) G = $\pm 2\%$ (≥ 10 pF) J = $\pm 5\%$ K = $\pm 10\%$ M = $\pm 20\%$	A = Not Applicable	B = 5% min lead X = FLEXITERM® with 5% min lead** **X7R only	2 = 7" Reel 4 = 13" Reel Contact Factory For Multiples*	A = Std. Product

*LD04 has the same CV ranges as LD03.

See FLEXITERM® section for CV options

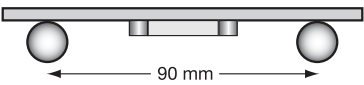
NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.



MLCC Tin/Lead Termination “B”

X7R – Specifications and Test Methods



Parameter/Test		X7R Specification Limits	Measuring Conditions	
Operating Temperature Range		-55°C to +125°C	Temperature Cycle Chamber	
Capacitance		Within specified tolerance	Freq.: 1.0 kHz $\pm$ 10% Voltage: 1.0Vrms $\pm$.2V	
Dissipation Factor		$\leq$ 10% for $\geq$ 50V DC rating $\leq$ 12.5% for 25V DC rating $\leq$ 12.5% for 25V and 16V DC rating $\leq$ 12.5% for $\leq$ 10V DC rating		
Insulation Resistance		100,000M Ω or 1000M Ω - μ F, whichever is less	Charge device with rated voltage for 120 $\pm$ 5 secs @ room temp/humidity	
Dielectric Strength		No breakdown or visual defects	Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) Note: Charge device with 150% of rated voltage for 500V devices.	
Resistance to Flexure Stresses	Appearance	No defects	Deflection: 2mm Test Time: 30 seconds 1mm/sec 	
	Capacitance Variation	$\leq \pm 12\%$		
	Dissipation Factor	Meets Initial Values (As Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3		
Solderability		$\geq$ 95% of each terminal should be covered with fresh solder	Dip device in eutectic solder at 230 $\pm$ 5°C for 5.0 $\pm$ 0.5 seconds	
Resistance to Solder Heat	Appearance	No defects, <25% leaching of either end terminal	Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 $\pm$ 2 hours before measuring electrical properties.	
	Capacitance Variation	$\leq \pm 7.5\%$		
	Dissipation Factor	Meets Initial Values (As Above)		
	Insulation Resistance	Meets Initial Values (As Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
Thermal Shock	Appearance	No visual defects	Step 1: -55°C $\pm$ 2°	30 $\pm$ 3 minutes
	Capacitance Variation	$\leq \pm 7.5\%$	Step 2: Room Temp	$\leq$ 3 minutes
	Dissipation Factor	Meets Initial Values (As Above)	Step 3: +125°C $\pm$ 2°	30 $\pm$ 3 minutes
	Insulation Resistance	Meets Initial Values (As Above)	Step 4: Room Temp	$\leq$ 3 minutes
	Dielectric Strength	Meets Initial Values (As Above)	Repeat for 5 cycles and measure after 24 $\pm$ 2 hours at room temperature	
Load Life	Appearance	No visual defects	Charge device with 1.5 rated voltage ($\leq$ 10V) in test chamber set at 125°C $\pm$ 2°C for 1000 hours (+48, -0) Remove from test chamber and stabilize at room temperature for 24 $\pm$ 2 hours before measuring.	
	Capacitance Variation	$\leq \pm 12.5\%$		
	Dissipation Factor	$\leq$ Initial Value x 2.0 (See Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
Load Humidity	Appearance	No visual defects	Store in a test chamber set at 85°C $\pm$ 2°C/ 85% $\pm$ 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature and humidity for 24 $\pm$ 2 hours before measuring.	
	Capacitance Variation	$\leq \pm 12.5\%$		
	Dissipation Factor	$\leq$ Initial Value x 2.0 (See Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		

MLCC Tin/Lead Termination “B”



X7R – Capacitance Range

PREFERRED SIZES ARE SHADED

SIZE		LD02			LD03						LD05						LD06									
Soldering		Reflow/Wave			Reflow/Wave						Reflow/Wave						Reflow/Wave									
Packaging		All Paper			All Paper						Paper/Embossed						Paper/Embossed									
(L) Length	mm	1.00 ± 0.10			1.60 ± 0.15						2.01 ± 0.20						3.20 ± 0.20									
	(in.)	(0.040 ± 0.004)			(0.063 ± 0.006)						(0.079 ± 0.008)						(0.126 ± 0.008)									
(W) Width	mm	0.50 ± 0.10			0.81 ± 0.15						1.25 ± 0.20						1.60 ± 0.20									
	(in.)	(0.020 ± 0.004)			(0.032 ± 0.006)						(0.049 ± 0.008)						(0.063 ± 0.008)									
(t) Terminal	mm	0.25 ± 0.15			0.35 ± 0.15						0.50 ± 0.25						0.50 ± 0.25									
	(in.)	(0.010 ± 0.006)			(0.014 ± 0.006)						(0.020 ± 0.010)						(0.020 ± 0.010)									
WVDC		16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	500
Cap (pF)	100																									
	150																									
	220			C																						
	330			C					G	G	G		J	J	J	J	J	J								K
	470			C					G	G	G		J	J	J	J	J	J								K
	680			C					G	G	G		J	J	J	J	J	J								K
	1000			C					G	G	G		J	J	J	J	J	J								K
	1500			C					G	G	G		J	J	J	J	J	J	J	J	J	J	J	J	J	M
	2200			C					G	G			J	J	J	J	J	J			J	J	J	J	J	M
	3300			C	C				G	G			J	J	J	J	J	J			J	J	J	J	J	M
	4700			C	C				G	G			J	J	J	J	J	J			J	J	J	J	J	M
	6800	C	C						G	G			J	J	J	J	J	J			J	J	J	J	J	P
Cap (µF)	0.010	C	C						G	G	G		J	J	J	J	J	J			J	J	J	J	J	P
	0.015	C							G	G			J	J	J	J	J	J			J	J	J	J	M	
	0.022	C							G	G			J	J	J	J	J	N			J	J	J	J	M	
	0.033	C							G	G			J	J	J	J	N				J	J	J	J	M	
	0.047								G	G			J	J	J	J	N				J	J	J	J	M	
	0.068								G	G			J	J	J	J	N				J	J	J	J	P	
	0.10		C*						G	G	G		J	J	J	J	N				J	J	J	J	P	P
	0.15								G	G			J	J	J	J	N				J	J	J	J	Q	
	0.22								G				J	J	J	N	N				J	J	J	J	Q	
	0.33												N	N	N	N	N				J	J	M	P	Q	
	0.47									J*			N	N	N	N	N				M	M	M	P	Q	
	0.68												N	N	N						M	M	Q	Q	Q	
	1.0								J*	J*			N	N	N*						M	M	Q	Q	Q	
	1.5																				P	Q	Q			
	2.2								J*												Q	Q	Q			
	3.3																									
	4.7																									
	10																									
	22																									
	47																									
	100																									
WVDC		16	25	50	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	6.3	10	16	25	50	100	200	500
SIZE		LD02			LD03						LD05						LD06									

Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
	PAPER					EMBOSS							

= Under Development

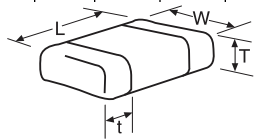
MLCC Tin/Lead Termination “B”



X7R – Capacitance Range

PREFERRED SIZES ARE SHADED

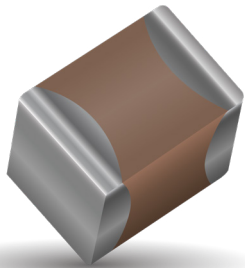
SIZE		LD10						LD12				LD13		LD20				LD14		
Soldering		Reflow Only						Reflow Only				Reflow Only		Reflow Only				Reflow Only		
Packaging		Paper/Embossed						All Embossed				All Embossed		All Embossed				All Embossed		
(L) Length	mm (in.)	3.20 ± 0.20 (0.126 ± 0.008)						4.50 ± 0.30 (0.177 ± 0.012)				4.50 ± 0.30 (0.177 ± 0.012)		5.70 ± 0.40 (0.225 ± 0.016)				5.72 ± 0.25 (0.225 ± 0.010)		
(W) Width	mm (in.)	2.50 ± 0.20 (0.098 ± 0.008)						3.20 ± 0.20 (0.126 ± 0.008)				6.40 ± 0.40 (0.252 ± 0.016)		5.00 ± 0.40 (0.197 ± 0.016)				6.35 ± 0.25 (0.250 ± 0.010)		
(t) Terminal	mm (in.)	0.50 ± 0.25 (0.020 ± 0.010)						0.61 ± 0.36 (0.024 ± 0.014)				0.61 ± 0.36 (0.024 ± 0.014)		0.64 ± 0.39 (0.025 ± 0.015)				0.64 ± 0.39 (0.025 ± 0.015)		
WVDC		10	16	25	50	100	200	500	50	100	200	500	50	100	25	50	100	200	50	100
Cap (pF)	100																			
	150																			
	220																			
	330																			
	470																			
	680																			
	1000																			
	1500	J	J	J	J	J	J	M												
	2200	J	J	J	J	J	J	M												
	3300	J	J	J	J	J	J	M												
	4700	J	J	J	J	J	J	M												
	6800	J	J	J	J	J	J	M												
Cap (µF)	0.010	J	J	J	J	J	J	M	K	K	K	K	M	M		X	X	X	M	P
	0.015	J	J	J	J	J	J	P	K	K	K	P	M	M		X	X	X	M	P
	0.022	J	J	J	J	J	J	Q	K	K	K	P	M	M		X	X	X	M	P
	0.033	J	J	J	J	J	J	Q	K	K	K	X	M	M		X	X	X	M	P
	0.047	J	J	J	J	J	J		K	K	K	Z	M	M		X	X	X	M	P
	0.068	J	J	J	J	J	M		K	K	K	Z	M	M		X	X	X	M	P
	0.10	J	J	J	J	J	M		K	K	K	Z	M	M		X	X	X	M	P
	0.15	J	J	J	J	M	Z		K	K	P		M	M		X	X	X	M	P
	0.22	J	J	J	J	P	Z		K	K	P		M	M		X	X	X	M	P
	0.33	J	J	J	J	Q			K	M	X		M	M		X	X	X	M	P
	0.47	M	M	M	M	Q			K	P			M	M		X	X	X	M	P
	0.68	M	M	P	X	X			M	Q			M	P		X	X		M	P
	1.0	N	N	P	X	Z			M	X			M	P		X	X		M	P
	1.5	N	N	Z	Z	Z			Z	Z			M			X	X		M	X
	2.2	X	X	Z	Z	Z			Z	Z						X	X		M	
	3.3	X	X	Z	Z				Z							X	Z			
	4.7	X	X	Z	Z				Z							X	Z			
	10	Z	Z	Z	Z											Z	Z			
	22	Z	Z												Z					
	47																			
	100																			
WVDC		10	16	25	50	100	200	500	50	100	200	500	50	100	25	50	100	200	50	100
SIZE		LD10						LD12				LD13		LD20				LD14		
Letter		A	C	E	G	J		K	M	N	P	Q	X	Y	Z					
Max. Thickness		0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)		1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)					
		PAPER						EMBOSSED												



MLCC Tin/Lead Termination “B”



X5R – General Specifications



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a “B” in the 12th position of the AVX Catalog Part Number. This fulfills AVX’s commitment to providing a full range of products to our customers. AVX has provided in the following pages a full range of values that we are currently offering in this special “B” termination. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination “B” products.

Not RoHS Compliant

PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

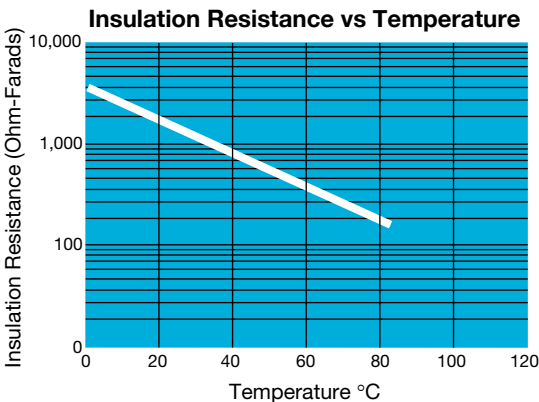
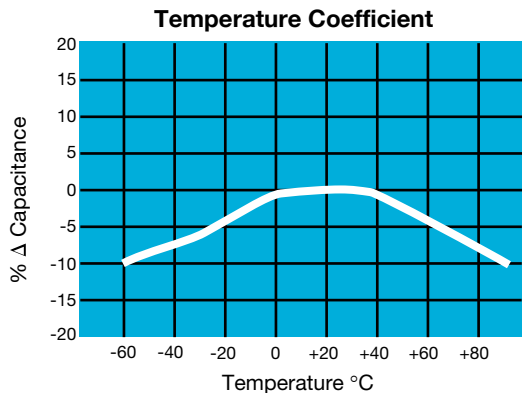
LD05	5	D	101	J	A	B	2	A
Size	Voltage	Dielectric	Capacitance Code (In pF)	Capacitance Tolerance	Failure Rate	Terminations	Packaging	Special Code
LD02 - 0402 LD03 - 0603 LD04 - 0504* LD05 - 0805 LD06 - 1206 LD10 - 1210 LD12 - 1812 LD13 - 1825 LD14 - 2225 LD20 - 2220	6.3V = 6 10V = Z 16V = Y 25V = 3 35V = D 50V = 5 100V = 1 200V = 2 500V = 7	X5R = D	2 Sig. Digits + Number of Zeros	B = ±10 pF (<10pF) C = ±25 pF (<10pF) D = ±50 pF (<10pF) F = ±1% (≥ 10 pF) G = ±2% (≥ 10 pF) J = ±5% K = ±10% M = ±20%	A = Not Applicable	B = 5% min lead X = FLEXITERM® with 5% min lead** **X7R only	2 = 7" Reel 4 = 13" Reel Contact Factory For Multiples*	A = Std. Product

*LD04 has the same CV ranges as LD03.

See FLEXITERM® section for CV options

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

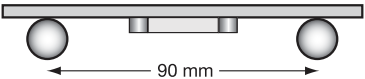
TYPICAL ELECTRICAL CHARACTERISTICS



MLCC Tin/Lead Termination “B”

X5R – Specifications and Test Methods



Parameter/Test		X5R Specification Limits	Measuring Conditions	
Operating Temperature Range		-55°C to +85°C	Temperature Cycle Chamber	
Capacitance		Within specified tolerance		
Dissipation Factor		$\leq 2.5\%$ for $\geq 50V$ DC rating $\leq 3.0\%$ for 25V, 35V DC rating $\leq 12.5\%$ Max. for 16V DC rating and lower Contact Factory for DF by PN	Freq.: 1.0 kHz $\pm 10\%$ Voltage: 1.0Vrms $\pm .2V$ For Cap > 10 μF , 0.5Vrms @ 120Hz	
Insulation Resistance		10,000M Ω or 500M Ω - μF , whichever is less	Charge device with rated voltage for 120 ± 5 secs @ room temp/humidity	
Dielectric Strength		No breakdown or visual defects	Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max)	
Resistance to Flexure Stresses	Appearance	No defects	Deflection: 2mm Test Time: 30 seconds  1mm/sec	
	Capacitance Variation	$\leq \pm 12\%$		
	Dissipation Factor	Meets Initial Values (As Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3		
Solderability		$\geq 95\%$ of each terminal should be covered with fresh solder	Dip device in eutectic solder at 230 $\pm 5^\circ C$ for 5.0 ± 0.5 seconds	
Resistance to Solder Heat	Appearance	No defects, <25% leaching of either end terminal	Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 ± 2 hours before measuring electrical properties.	
	Capacitance Variation	$\leq \pm 7.5\%$		
	Dissipation Factor	Meets Initial Values (As Above)		
	Insulation Resistance	Meets Initial Values (As Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
Thermal Shock	Appearance	No visual defects	Step 1: -55°C $\pm 2^\circ$	30 ± 3 minutes
	Capacitance Variation	$\leq \pm 7.5\%$	Step 2: Room Temp	≤ 3 minutes
	Dissipation Factor	Meets Initial Values (As Above)	Step 3: +85°C $\pm 2^\circ$	30 ± 3 minutes
	Insulation Resistance	Meets Initial Values (As Above)	Step 4: Room Temp	≤ 3 minutes
	Dielectric Strength	Meets Initial Values (As Above)	Repeat for 5 cycles and measure after 24 ± 2 hours at room temperature	
Load Life	Appearance	No visual defects	Charge device with 1.5X rated voltage in test chamber set at 85°C $\pm 2^\circ C$ for 1000 hours (+48, -0). Note: Contact factory for *optional specification part numbers that are tested at $< 1.5X$ rated voltage. Remove from test chamber and stabilize at room temperature for 24 ± 2 hours before measuring.	
	Capacitance Variation	$\leq \pm 12.5\%$		
	Dissipation Factor	$\leq$ Initial Value x 2.0 (See Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		
Load Humidity	Appearance	No visual defects	Store in a test chamber set at 85°C $\pm 2^\circ C$ / 85% $\pm$ 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature and humidity for 24 ± 2 hours before measuring.	
	Capacitance Variation	$\leq \pm 12.5\%$		
	Dissipation Factor	$\leq$ Initial Value x 2.0 (See Above)		
	Insulation Resistance	$\geq$ Initial Value x 0.3 (See Above)		
	Dielectric Strength	Meets Initial Values (As Above)		

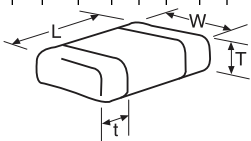
MLCC Tin/Lead Termination “B”



X5R – Capacitance Range

PREFERRED SIZES ARE SHADED

SIZE		LD02					LD03					LD05					LD06					LD10					LD12											
Soldering		Reflow/Wave					Reflow/Wave					Reflow/Wave					Reflow/Wave					Reflow/Wave																
Packaging		All Paper					All Paper					Paper/Embossed					Paper/Embossed					Paper/Embossed																
(L) Length	mm	1.00 ± 0.10					1.60 ± 0.15					2.01 ± 0.20					3.20 ± 0.20					3.20 ± 0.20																
	(in.)	(0.040 ± 0.004)					(0.063 ± 0.006)					(0.079 ± 0.008)					(0.126 ± 0.008)					(0.126 ± 0.008)																
(W) Width	mm	0.50 ± 0.10					0.81 ± 0.15					1.25 ± 0.20					1.60 ± 0.20					2.50 ± 0.20																
	(in.)	(0.020 ± 0.004)					(0.032 ± 0.006)					(0.049 ± 0.008)					(0.063 ± 0.008)					(0.098 ± 0.008)																
(t) Terminal	mm	0.25 ± 0.15					0.35 ± 0.15					0.50 ± 0.25					0.50 ± 0.25					0.50 ± 0.25																
	(in.)	(0.010 ± 0.006)					(0.014 ± 0.006)					(0.020 ± 0.010)					(0.020 ± 0.010)					(0.020 ± 0.010)																
WVDC		4	6.3	10	16	25	50	4	6.3	10	16	25	35	50	6.3	10	16	25	35	50	6.3	10	16	25	35	50	4	6.3	10	16	25	35	50	6.3	10	25	50	
Cap (pF)	100																																					
	150																																					
	220						C																															
	330						C																															
	470						C																															
	680						C																															
	1000						C																															
	1500						C																															
	2200						C																															
	3300						C																															
	4700													G																								
	6800						C							G																								
Cap (µF)	0.010						C							G																								
	0.015						C							G																								
	0.022						C							G																								
	0.033						C							G																								
	0.047						C							G																								
	0.068						C							G																								
	0.10						C							G																								
	0.15						C							G																								
	0.22						C*							G																								
	0.33													G																								
	0.47						C*							G																								
	0.68						C*							G																								
	1.0						C*							G																								
	1.5						C*							G																								
	2.2						C*							G																								
	3.3													G																								
	4.7													G																								
	10													G																								
	22													G																								
	47													G																								
	100													G																								
	WVDC		4	6.3	10	16	25	50	4	6.3	10	16	25	35	50	6.3	10	16	25	35	50	6.3	10	16	25	35	50	4	6.3	10	16	25	35	50	6.3	10	25	50
	SIZE		LD02					LD03					LD05					LD06					LD10					LD12										



Letter	A	C	E	G	J	K	M	N	P	Q	X	Y	Z
Max. Thickness	0.33 (0.013)	0.56 (0.022)	0.71 (0.028)	0.90 (0.035)	0.94 (0.037)	1.02 (0.040)	1.27 (0.050)	1.40 (0.055)	1.52 (0.060)	1.78 (0.070)	2.29 (0.090)	2.54 (0.100)	2.79 (0.110)
PAPER						EMBOSED							

*Optional Specifications – Contact factory

NOTE: Contact factory for non-specified capacitance values